

We Claim:

1. A method for controlling fuel injection into an engine having an exhaust system with an emission control device located therein, the method comprising:

5 reading information from a downstream sensor coupled in said emission control system downstream of said emission control device, said information including a substantially linear indication of exhaust air-fuel ratio across a range of air-fuel ratios from at least 12:1 to 18:1, said information also
10 including a substantially non-linear indication of stoichiometry;

adjusting a setpoint for an upstream sensor based on said signal; and

adjusting fuel injection into the engine based on said
15 adjusted setpoint and a signal from said upstream sensor.

2. The method of claim 1 wherein said information is provided by a signal.

20 3. The method of claim 1 wherein said information from said downstream sensor includes said substantially linear indication under a first set of conditions, and includes said substantially non-linear indication of stoichiometry under a second set of conditions.

25 4. The method of claim 1 wherein said substantially non-linear indication is sampled from a signal providing said substantially linear indication at a preselected condition.

30 5. The method of claim 1 wherein said upstream sensor is a HEGO sensor.

6. The method of claim 1 wherein said upstream sensor is a UEGO sensor.

7. The method of claim 1 wherein said adjusting fuel injection into the engine further includes adjusting fuel injection into the engine based on an error between said adjusted setpoint and a signal from said upstream sensor.

8. The method of claim 1 wherein said adjusted setpoint is adjusted to be a stoichiometric value.

9. A method for controlling fuel injection into an engine having an exhaust system with an emission control device located therein, the method comprising:

15 reading information from a downstream sensor coupled in said emission control system downstream of said emission control device, said information including a substantially linear indication of exhaust air-fuel ratio across a range of air-fuel ratios from at least 12:1 to 18:1;

20 reading information from said sensor identifying a stoichiometric region, said information based on a measurement signal obtained from said sensor differently than a measurement signal used to produce said substantially linear indication;

25 adjusting a setpoint for an upstream sensor based on said signal; and

adjusting fuel injection into the engine based on said adjusted setpoint and a signal from said upstream sensor.

10. The method of claim 9 wherein said stoichiometric region is a stoichiometric point.

11. The method of claim 9 wherein said adjusted setpoint is adjusted to be a stoichiometric value.

12. A system comprising:

5 a sensor generating a first signal providing a substantially linear indication of exhaust air-fuel ratio during a first set of conditions, and a second signal generating a substantially non-linear indication of exhaust air-fuel ratio during a second set of conditions; and

10 a computer storage medium having instructions encoded therein for controlling fuel injection into an engine having an exhaust system with an emission control device located therein, said medium comprising:

code for reading said first and second signal from
15 said sensor;

code for adjusting a setpoint, for a feedback controller for an sensor coupled upstream of said emission control device, based on said first and second signals; and

code for adjusting fuel injection into the engine
20 based on said adjusted setpoint and a signal from said upstream sensor.

13. The system of claim 12 first signal and second signal are provided via an electronic circuit coupled to said sensor, and wherein said emission control device is located upstream of
25 said sensor.

14. The system of claim 12 wherein said second signal is sampled from said first signal during said second set of
30 operating conditions.

15. The system of claim 12 wherein said upstream sensor is a HEGO sensor.

16. The system of claim 12 wherein said upstream sensor is
5 a UEGO sensor.

17. The system of claim 12 wherein said code for adjusting fuel injection into the engine further includes code for adjusting fuel injection into the engine based on an error
10 between said adjusted setpoint and a signal from said upstream sensor.

18. The system of claim 17 wherein said adjusted setpoint is adjusted to be a stoichiometric value.
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